

The Periodic Table : Element properties _____ / 20

Pre-lab questions:

1. What is a chemical element? (1 point)
2. Make a list of four or more substances that you use or encounter everyday that meet your definition of an element. (1 points)
 - 1.
 - 2.
 - 3.
 - 4.
3. The ancient Greeks believed that the four elements were earth, air, fire, and water.

The early alchemists (people who practiced science in the Middle Ages with the goal of changing ordinary metals into gold, or ordinary materials into something special) identified three elements: mercury, sulfur and salt.

Does each of the above “elements” satisfy your definition of an element? Why or why not? (2 points)

Introduction

At the stations set up around your classroom are several cups/beakers, each containing a sample of a unique element. Each cup is labeled with the element name, **CONTENTS SHOULD NOT BE MIXED**. Your lab group will observe and test each element. As you visit a station, you will collect and record data in the data table. You will then use the data to determine whether the element is a metal, a metalloid or a non-metal.

Materials

Carbon	Sulfur	Aluminum	Hammer
Zinc	Magnesium	Tin	
Silicon	Copper	Conductivity meters	

Procedure

1. Observe each element and record your observations. Use words such as shiny / luster, hard / soft, powdery / fixed shape solid, describe the color, pick up the container - describe the density, etc.
 2. One of the properties of the chemical elements on Medneleev’s table was the ability to conduct electricity.
 - a. Insert the terminals into the cup/beaker, be sure both terminals are touching the element.
 - b. Record the elements ability to conduct electricity in the table. (Yes it is conductive or no it is not conductive).
 - c. If both the red and green light bulb lights up, it is a good conductor indicate this with a + sign. If only the red lightbulb lights up, it is able to conduct electricity but not as efficiently indicate this with a - sign.
- NOTE: It is important that the terminals stay dry and clean (uncontaminated). Wipe the terminals off with a paper towel between each tested element.
3. Take another look at the appearance of the element sample.
 - a. Just by looking at the element - is it evident that it is malleable? (Is this element able to be hammered out into sheets? You can tell by the shape that it is in.... if it is flattened into a thin sheet, the answer is yes)
 - b. b. If an element is brittle it is unable to be hammered out into sheets, when hit with a hammer it will shatter.
**** Use the hammer in your tub to test carbon and silicon’s ability to be hammered out into sheets.
 - c. Record your observation in the table, Yes it is malleable or no it is not malleable.
 4. Get out your periodic table, look at the location of each element and record its location using the following options: left of the staircase, on the staircase, or to the right of the staircase.
 5. Classify the element as a metal, metalloid or a non-metal.

(8 points)

Element	Symbol	initial observation	conducts electricity (yes or no)	is it malleable? (yes or no)	location of the element on the periodic table (left, right, on)	metal, metalloid or non-metal?
Aluminum						
Copper						
Carbon				***		
Magnesium						
Silicon				***		
Sulfur						
Zinc						
Tin						

Post Lab Questions:

1. a. Look at the table above, how many of each type of elements were we able to test? (Record: # of metals, non-metals or metalloids) (1 point)
- b. Why were we only able to test 2 non-metals? Hint.... look at your coded periodic table. There should be a visible indicator as to why we were unable to test more elements in this category. (1 point)
2. a. It is okay to only run one test or to visually assess a sample to determine whether it is a metalloid? Why or why not? (2 points)
- b. Identify at least 2 other tests that you could run to identify whether an element is a metal, non-metal or a metalloid. Hint - think about the tests in the webquest! (2 points)
3. What were 2 groups of **metals** that were completely untested? Why do you think we were unable to test those metals? (2 points)